

WHAT IS CLAIMED IS:

1.  $\mu$ -law-to-A-law translating equipment, comprising:
  - a timing pulse generator that generates a reference frame pulse;
  - a  $\mu$ -law signal receiving circuit that receives a  $\mu$ -law PCM signal and outputs parallel  $\mu$ -law PCM signals according to a reference frame pulse;
  - a multiplexer that time-division multiplexes plural parallel  $\mu$ -law PCM signals and outputs a time-division multiplexed  $\mu$ -law PCM signal;
  - a  $\mu$ -law-to-A-law converter that converts the time-division multiplexed  $\mu$ -law PCM signal to a time-division multiplexed A-law PCM signal;
  - a demultiplexer that demultiplexes the time-division multiplexed A-law PCM signal and outputs plural parallel A-law PCM signals; and
  - an A-law signal output circuit that receives the parallel A-law PCM signals and outputs a serial A-law PCM signal.

2.  $\mu$ -law-to-A-law translating equipment according to Claim 1, comprising:
  - respective plural and the same number of  $\mu$ -law signal receiving circuits and A-law signal output circuits.

3.  $\mu$ -law-to-A-law translating equipment according to Claim 1, wherein:
  - the  $\mu$ -law signal receiving circuit comprises:
    - a line receiver that converts a  $\mu$ -law PCM signal from

5 bipolar to unipolar and outputs a unipolar  $\mu$ -law signal;  
6 a frame buffer that temporarily stores the unipolar  $\mu$   
7 -law signal;  
8 a frame detector that detects the frame leading part of  
9 the unipolar  $\mu$ -law signal and generates an address reset pulse  
10 synchronized with the frame leading position for writing to the  
11 frame buffer;  
12 a frame position comparator that measures the time lag  
13 in a position of a reference frame pulse and the address reset  
14 pulse for writing to the frame buffer and generates an address  
15 reset pulse for reading from the frame buffer; and  
16 a serial-parallel converter that converts and outputs a  
17 serial  $\mu$ -law PCM signal read from the frame buffer to parallel  
18  $\mu$ -law PCM signals.

1 4.  $\mu$ -law-to-A-law translating equipment according to Claim  
2 1, wherein:

3 the A-law signal output circuit comprises:  
4 a parallel-serial converter that converts parallel A-  
5 law PCM signals to a serial A-law PCM signal; and  
6 a frame inserter that inserts a frame bit into the serial  
7 A-law PCM signal.

1 5.  $\mu$ -law-to-A-law translating equipment according to Claim  
2 4, wherein:

3 the frame inserter inserts a frame bit according to a  
4 reference frame pulse.

1 6.  $\mu$ -law-to-A-law translating equipment according to Claim  
2 4, wherein:

3 the A-law signal output circuit further comprises:  
4 a line driver that outputs a serial A-law PCM signal at  
5 a predetermined output amplitude level.

1 7. A-law-to- $\mu$ -law translating equipment, comprising:  
2 a timing pulse generator that generates a reference frame  
3 pulse;

4 an A-law signal receiving circuit that receives an A-  
5 law PCM signal and outputs parallel A-law PCM signals according  
6 to a reference frame pulse;

7 a multiplexer that time-division multiplexes plural  
8 parallel A-law PCM signals and outputs a time-division  
9 multiplexed A-law PCM signal;

10 an A-law-to- $\mu$ -law converter that converts the time-  
11 division multiplexed A-law PCM signal to a time-division  
12 multiplexed  $\mu$ -law PCM signal;

13 a demultiplexer that demultiplexes the time-division  
14 multiplexed  $\mu$ -law PCM signal and outputs plural parallel  $\mu$ -  
15 law PCM signals; and

16 a  $\mu$ -law signal output circuit that receives parallel  
17  $\mu$ -law PCM signals and outputs a serial  $\mu$ -law PCM signal.

1 8. A-law-to- $\mu$ -law translating equipment according to Claim  
2 7, comprising:

3 respective plural and the same number of A-law signal  
4 receiving circuits and  $\mu$ -law signal output circuits.

1 9. A-law-to- $\mu$ -law translating equipment according to Claim  
2 7, wherein:

3 the A-law signal receiving circuit comprises:

4 a line receiver that converts an A-law PCM signal from  
5 bipolar to unipolar and outputs a unipolar A-law signal;

6 a frame buffer that temporarily stores the unipolar A-law  
7 signal;

8 a frame detector that detects the frame leading part of  
9 the unipolar A-law signal and generates an address reset pulse  
10 synchronized with the frame leading position for writing to the  
11 frame buffer;

12 a frame position comparator that measures the time lag  
13 in a position of a reference frame pulse and the address reset  
14 pulse for writing to the frame buffer and generates an address  
15 reset pulse for reading from the frame buffer; and

16 a serial-parallel converter that converts a serial A-  
17 law PCM signal read from the frame buffer to parallel A-law PCM  
18 signals.

1 10. A-law-to- $\mu$ -law translating equipment according to Claim  
2 7, wherein:

3 the  $\mu$ -law signal output circuit comprises:

4 a parallel-serial converter that converts parallel  $\mu$   
5 -law PCM signals to a serial  $\mu$ -law PCM signal; and

6 a frame inserter that inserts a frame bit into the serial  
7  $\mu$ -law PCM signal.

1 11. A-law-to- $\mu$ -law translating equipment according to Claim

2 10, wherein:

3 the frame inserter adds a frame bit to the serial  $\mu$ -  
4 law PCM signal according to a reference frame pulse.

1 12. A-law-to- $\mu$ -law translating equipment according to Claim  
2 10, wherein:

3 the  $\mu$ -law signal output circuit further comprises:  
4 a line driver that outputs a serial  $\mu$ -law PCM signal at  
5 a predetermined output amplitude level.

1 13.  $\mu$ -law-to-A-law and A-law-to- $\mu$ -law translating  
2 equipment, comprising:

3 a timing pulse generator that generates a reference frame  
4 pulse;

5  $\mu$ -law-to-A-law translating equipment; and

6 A-law-to- $\mu$ -law translating equipment, wherein:

7 the  $\mu$ -law-to-A-law translating equipment comprises:

8 a  $\mu$ -law signal receiving circuit that receives a  $\mu$ -law  
9 PCM signal and outputs parallel  $\mu$ -law PCM signals according  
10 to a reference frame pulse;

11 a multiplexer that time-division multiplexes plural  
12 parallel  $\mu$ -law PCM signals and outputs a time-division  
13 multiplexed  $\mu$ -law PCM signal;

14 a  $\mu$ -law-to-A-law converter that converts the time-  
15 division multiplexed  $\mu$ -law PCM signal to a time-division  
16 multiplexed A-law PCM signal;

17 a demultiplexer that demultiplexes the time-division  
18 multiplexed A-law PCM signal and outputs plural parallel A-

19 law PCM signals;

20 an A-law signal output circuit that receives the parallel  
21 A-law PCM signals and outputs a serial A-law PCM signal; and

22 the A-law-to- $\mu$ -law translating equipment comprises:

23 an A-law signal receiving circuit that receives an A-  
24 law PCM signal and outputs parallel A-law PCM signals according  
25 to a reference frame pulse;

26 a multiplexer that time-division multiplexes plural  
27 parallel A-law PCM signals and outputs a time-division  
28 multiplexed A-law PCM signal;

29 an A-law-to- $\mu$ -law converter that converts the time-  
30 division multiplexed A-law PCM signal to a time-division  
31 multiplexed  $\mu$ -law PCM signal;

32 a demultiplexer that demultiplexes the time-division  
33 multiplexed  $\mu$ -law PCM signal and outputs plural parallel  $\mu$ -  
34 law PCM signals; and

35 a  $\mu$ -law signal output circuit that receives the parallel  
36  $\mu$ -law PCM signals and outputs a serial  $\mu$ -law PCM signal.

1 14.  $\mu$ -law-to-A-law and A-law-to- $\mu$ -law translating  
2 equipment according to Claim 13, wherein:

3 the  $\mu$ -law-to-A-law translating equipment comprises  
4 respective plural and the same number of  $\mu$ -law signal receiving  
5 circuits and A-law signal output circuits; and

6 the A-law-to- $\mu$ -law translating equipment comprises  
7 respective plural and the same number of A-law signal receiving  
8 circuits and  $\mu$ -law signal output circuits.